

Claims

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1. An optical arrangement, in particular a micro-lithographic projection printing installation, in particular having a slot-shaped image field or rotationally non-symmetrical illumination, comprising a light source which emits radiation, and an optical element which is heated by being acted upon by the radiation, and a supply apparatus for gas for tempering the optical element,  
  
wherein  
  
the supply apparatus (11, 19 to 23) comprises at least one supply line (21) and at least one gas directing device (11), which is aligned relative to the optical element (5) and controllable in such a way that the gas is directed by the gas directing device (11) as a free flow towards the optical element (5) and the volumetric flow of the exiting gas has a magnitude and spatial distribution (17), which are adapted to the intensity distribution (6) of the radiation (1).
  2. An optical arrangement as claimed in claim 1, wherein a throttle valve (23) is disposed in at least one supply line (21) for the gas directing device (11).
  3. An optical arrangement as claimed in claim 1 ~~or 2~~, wherein the gas directing device is formed by at least one nozzle (11), which is connected by the supply line (21) to a gas source (22).
  4. An optical arrangement as claimed in <sup>claim 1</sup> ~~one of the preceding claims~~, wherein a plurality of gas directing devices (11) are provided, with each of which a throttle valve (20) in a supply line section (19) is associated.

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5. An optical arrangement as claimed in ~~one of the preceding claims~~ <sup>claim 1</sup>, wherein an adjustable holding device (9) for the gas directing device (11) is provided.
- 5 6. An optical arrangement as claimed in claim 5, wherein the holding device (9) comprises an adjusting device (12) for adjusting the axial position of the gas directing device (11) relative to the optical element (5).
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- a 7. An optical arrangement as claimed in claim 5 ~~or 6~~, wherein the holding device (9) comprises an adjusting device (12) for adjusting the inclination of the gas directing device (11) relative to the optical element (5).
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- a 8. An optical arrangement as claimed in ~~one of claims 2 to 8~~ <sup>claim 2</sup>, wherein there is a control device (25) with a communication link to the at least one throttle valve (20, 23) for selecting a volumetric flow of gas in the gas directing device (11).
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9. An optical arrangement as claimed in claim 8, wherein the control device (25) has a communication link (27, 28, A) to the light source (2) for receiving a signal corresponding to the light output of the light source, wherein the selection of the volumetric flow of gas is effected by the control device (25) in dependence upon the transmitted signal of the light source (2).
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- a 10. An optical arrangement as claimed in claim 8 ~~or 9~~, wherein there is a sensor arrangement (31) with a communication link (27, 28, 30) to the control device (25) for monitoring the imaging quality of the optical element (5) and/or of the optical arrangement (4, 5), wherein the selection of the volumetric flow of gas is
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effected by the control device (25) in dependence upon the transmitted signal data of the sensor arrangement (31).

- 5 11. An optical arrangement as claimed in claim 10, wherein the sensor arrangement comprises a CCD array (31).

12. An optical arrangement as claimed in ~~one of the preceding claims~~, wherein the gas directing device (11) is part of a sweeping device for the optical element (5) and/or the optical arrangement (4, 5).

- a 13. An optical arrangement as claimed in ~~one of the preceding claims~~, wherein there is a thermostatted tempering device (24) in the supply line (21).